**Small Business Innovation Research/Small Business Tech Transfer**

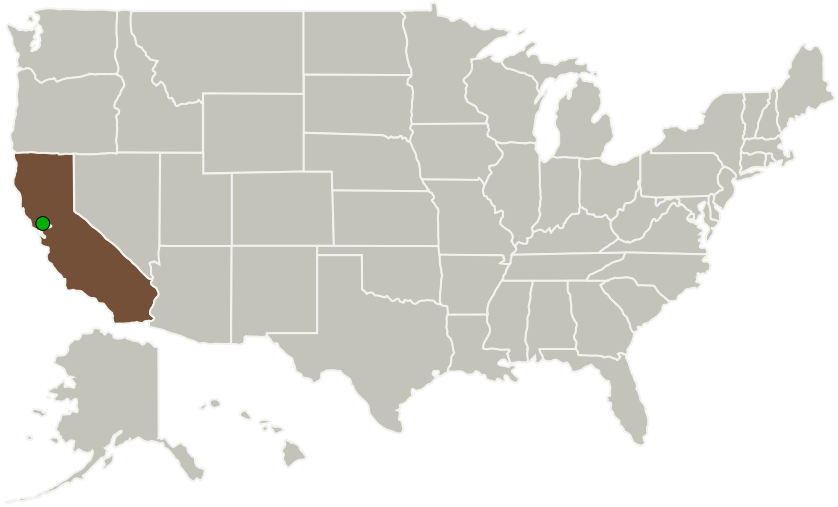
# Airport Gate Activity Monitoring Tool Suite for Improved Turnaround Prediction, Phase I

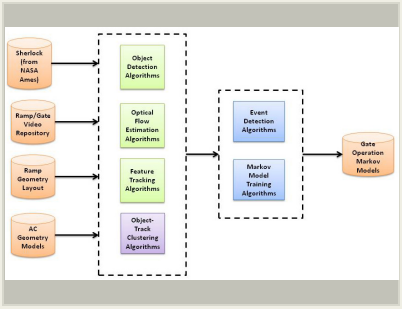
Completed Technology Project (2015 - 2015)

## Project Introduction

The objective of this research is to create a suite of tools for monitoring airport gate activities with the objective of improving aircraft turnaround. Airport ramp areas are the most crowded and cluttered spaces in the entire National Airspace System (NAS). Activities related to turnaround of the aircraft from the gate represent a significant source of delay and therefore impact the predictability of NAS operations. Optimal Synthesis Inc., seeks to leverage its expertise in monitoring aircraft in the ramp areas using video surveillance data and advanced computer vision algorithms towards building an advanced gate activity monitoring that will in turn enable a gate turnaround prediction tool. The tool suite will specifically identify the various stages of turnaround such as refueling, luggage unloading/loading, catering, and deicing. It will further create a probabilistic model of the times associated with each of these events, that will be used for predicting the future sequence of events and their predicted times of completion. Phase I research will demonstrate the core ideas of gate activity recognition using state-of-the-art computer vision and machine learning algorithms. Phase II research will elevate the technology readiness level of this tool suite to work with real-time video surveillance streams.

## Primary U.S. Work Locations and Key Partners






Airport Gate Activity Monitoring Tool Suite for Improved Turnaround Prediction, Phase I

## Table of Contents

# Airport Gate Activity Monitoring Tool Suite for Improved Turnaround Prediction, Phase I

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Optimal Synthesis, Inc. | Lead Organization | Industry<br>Small Disadvantaged Business (SDB) | Los Altos, California |
| Ames Research Center(ARC) | Supporting Organization | NASA Center | Moffett Field, California |

| Primary U.S. Work Locations |
|---|
| California |

## Project Transitions

**June 2015:** Project Start

**December 2015:** Closed out

**Closeout Summary:** Airport Gate Activity Monitoring Tool Suite for Improved T urnaround Prediction, Phase I Project Image

**Closeout Documentation:**

- Final Summary Chart Image*(https://techport.nasa.gov/file/138694)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Optimal Synthesis, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Veera V Vaddi

**Co-Investigator:**

Veera Vaddi

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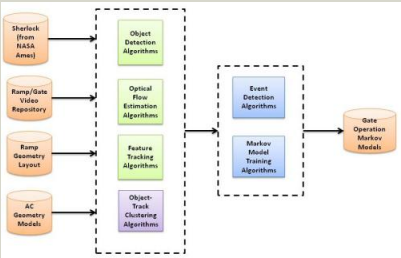
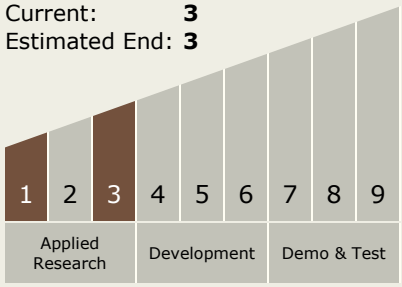
## Images




**Briefing Chart Image**
Airport Gate Activity Monitoring Tool Suite for Improved Turnaround Prediction, Phase I
*(https://techport.nasa.gov/image/126101)*

## Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**




## Technology Areas

**Primary:**

- TX01 Propulsion Systems
  - TX01.3 Aero Propulsion
    - TX01.3.1 Integrated Systems and Ancillary Technologies

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System